

### **REMARKS**

Reconsideration is respectfully requested.

#### **Status of the Claims**

Claims 1 - 6, 9 - 14, 17, 20, 21 and 23 - 37 are currently pending, with claims 7, 8, 15, 16, 18, 19, and 22 having previously been canceled without prejudice or disclaimer. Claim 9 is amended, and claims 38 - 40 are newly added. No new matter is introduced.

#### **Withdrawal from Issue**

A Notice of Allowance was mailed on March 27, 2008. However, a Notice of Withdrawal from Issue was subsequently mailed on May 13, 2008, in response to a question raised by the United States Patent & Trademark Office ("the Office") as to the patentability of current claim 9. Applicant thanks Examiner Hiteshew for contacting Applicant's representative on May 26, 2008 to discuss the Office's question.

Specifically, the Office asserts that claim 9 is obvious in view of two references cited in the Background section of the application:

- 13th International Conference on Indium Phosphide and Related Materials, Post Deadline Papers, Tsukuba, Ibaraki (1998) 15-16 (asserted as disclosing "an Fe-doped InP crystal with an etch pit density (EPD) (or dislocation density) of (100) wafer being 3000 cm<sup>-2</sup>"), hereinafter "Tsukuba"; and
- 14th International Conference on Indium Phosphide and Related Materials, Davos, Switzerland, (1999) 249-254 (asserted as disclosing "Fe-doped (100) InP wafers wherein the direction of growth has a (100. orientation"), hereinafter "Davos."

As a result, claim 9 and claims 11 and 12, which depend from claim 9, stand rejected under 35 U.S.C. § 103(a).

Applicant amends current claim 9 and introduces new claim 38 to further clarify the nature of his invention, and respectfully traverse the Office's obviousness rejection. Amended claim 9 and new claim 38 are reproduced below:

**Claim 9:** An indium phosphide crystal containing tin as a dopant, wherein:  
a direction of growth has a  $\langle 100 \rangle$  orientation; and  
an average dislocation density value on a (100) plane, which is perpendicular to said growth direction, is less than  $5000 \text{ cm}^{-2}$ .

**Claim 38:** An indium phosphide crystal containing iron as a dopant, wherein:  
a direction of growth has a  $\langle 100 \rangle$  orientation; and  
an average dislocation density value on a (100) plane, which is perpendicular to said growth direction, is less than  $2500 \text{ cm}^{-2}$ .

Applicant amends claim 9 to eliminate iron and maintain tin as a dopant of the claimed indium phosphide (InP) crystal.. Applicant submits that neither the Tsukuba reference, nor any other of the disclosed prior art references, disclose the use of tin as an InP dopant.

New claim 38 claims an InP crystal containing iron as dopant, and having an average dislocation density value on a (100) plane, which is perpendicular to said growth direction, that is less than  $2500 \text{ cm}^{-2}$ . New claim 38 finds support, for example, at page 15, lines 21 and 22 of Applicant's specification, which states that "[at] the front end [of the wafer], the etch pit density is  $2,500 \text{ cm}^{-2}$ , and at the tail end, that is  $2,000 \text{ cm}^{-2}$ ."

Applicant offers the following additional comments. While not explicitly mentioned in the present application, Applicant acknowledges that because InP crystals which are tin-doped are often used as a substrate for the preparation of devices for optical communications, reduction in dislocation density is very important. Unlike Sulfur or Zinc, tin produces no hardening action with the addition of impurities (see, e.g., Japanese Patent Application No. 08-237088). As a result, it becomes difficult to reduced dislocation densities. Thus, Applicant's claimed result (i.e., an InP crystal with tin doping having an average dislocation density less than  $5000 \text{ cm}^{-2}$ ) is an important result first available as a consequence of the manufacturing methods disclosed by Applicants.

Applicant also adds new claims 39 and 40, depending from new claim 38. New claims 39 and 40 correspond to previously presented claims 11 and 12, which depend from amended claim 9.

Therefore, Applicant respectfully requests that the rejection of claims 9, 11 and 12 under 35 U.S.C. § 103(a) be withdrawn, and that new claim 38 - 40 be entered as allowable.

**CONCLUSION**

In view of the foregoing, it is believed that claims 1- 6, 7, 9 - 14, 17, and 20 - 40 are in condition for allowance, and it is respectfully requested that the application be reconsidered, that all pending and new claims be allowed, and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: May 27, 2008

Respectfully submitted,

By 

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